

# Chunhui Liu

5 Yiheyuan Road  
Beijing, P.R. China, 100871

+86 18811799536 (cell)  
liuchunhui@pku.edu.cn  
<https://echo960.github.io/>

## Education

---

- **Peking University** Beijing R.P.China  
*Bachelor in Computer Science, EECS* Sep. 2014 - present  
– Overall GPA: 3.58/4.0, Major GPA: 3.68/4.0

## Publication

---

- (1) **Do Convolutional Neural Networks act as Compositional Nearest Neighbors?**  
**Chunhui Liu**, Aayush Bansal, Victor Fragoso, Deva Ramanan  
*Submitted to International Conference on Learning Representations (ICLR2018), Vancouver, BC, Canada.*
- (2) **PKU-MMD: A Large Scale Benchmark for Skeleton-Based Human Action Understanding**  
**Chunhui Liu**, Yueyu Hu, Yanghao Li, Sijie Song, Jiaying Liu  
*Accepted by ACM Multimedia workshop (ACM MM workshop), Silicon Valley, California, U.S., Oct. 2017.*
- (3) **Temporal Perceptive Network for Skeleton-Based Action Recognition**  
Yueyu Hu, **Chunhui Liu**, Yanghao Li, Sijie Song and Jiaying Liu  
*Accepted by British Machine Vision Conference (BMVC2017), London, UK, Sep. 2017.*
- (4) **Online Action Detection and Forecast via Multi-Task Deep Recurrent Neural Network**  
**Chunhui Liu**, Yanghao Li, Yueyu Hu, Jiaying Liu  
*Accepted by IEEE International Conference on Acoustic, Speech, and Signal Processing (ICASSP2017), New Orleans, LA, U.S, Mar. 2017.*

## Pattern

---

- (A) **A Multi-Task Deep RNN Model for Online Action Detection and Forecast.**  
**Chunhui Liu**, Yanghao Li, Yueyu Hu, Jiaying Liu, Zongming Guo  
*201710146933.5, China., filed in Mar. 2017*

## Research Experience

---

- Research in Activity Understanding  
Advisor: Jiaying Liu, Associate Professor, Institute of Computer Science and Technology (ICST), Peking University  
**Online Action Detection and Forecast on 3D Skeleton Data.**<sup>(1),(A)</sup> PKU, Beijing  
[http://www.icst.pku.edu.cn/struct/Projects/multitask\\_OAD.html](http://www.icst.pku.edu.cn/struct/Projects/multitask_OAD.html) Feb. 2016 - Sep. 2016
  - Built an end-to-end multi-task deep network for activity detection and forecast.
  - Utilized 3-Stacked LSTM to model action dynamic and multi-task network to detect and forecast action synchronously.
  - Proposed First online algorithm on precisely forecasting action occurrence on frame level.
  - Accepted by *IEEE International Conference on Acoustic, Speech, and Signal Processing (ICASSP2017).*
- Large Scale Action Recognition on 3D Skeleton.**<sup>(2)</sup> PKU, Beijing  
[http://www.icst.pku.edu.cn/struct/Pub%20Files/2017/hyy\\_bmvc17.pdf](http://www.icst.pku.edu.cn/struct/Pub%20Files/2017/hyy_bmvc17.pdf) Sep. 2016 - Feb. 2017
  - Proposed a Temporal Perceptive Network using LSTM to model high-order dynamics.
  - 2%-10% better than state-of-the-art performance.

- Ranked first in *ACCV Large Scale 3D Human Activity Analysis Challenge in Depth Videos* (ACCV 2016 workshop).
- Accepted by *British Machine Vision Conference* (BMVC2017).

### Large Scale 3D Action Benchmark and Workshops.<sup>(3)</sup>

PKU, Beijing

<http://www.icst.pku.edu.cn/struct/Projects/PKUMMD.html>

Feb. 2017 - present

- Proposed a large-scale multi-modal benchmark for action understanding.
- Largest dataset for 3D action detection, first dataset focusing on multi-modal action understanding.
- Used for conducting *IEEE International Conference on Multimedia and Expo - Large Scale 3D Human Activity Analysis Challenge in Depth Videos* (ICME2017 Workshop).
- Accepted by *ACM Multimedia workshop* (ACM MM workshop).

### • Research in Interpretability of Deep Networks

Advisor: Deva Ramanan, Associate Professor, Robotics Institute (RI), Carnegie Mellon University

### Visualizing and Interpreting Convolutional Neural Networks.<sup>(4)</sup>

CMU, Pittsburgh

<https://openreview.net/forum?id=By4Nxm-CW>

Jul. 2017 - present

- Proposed a pixel-wise non-parametric method to interpret Convolutional Deep Networks and Generative Adversarial Networks.
- Demonstrating Convolutional Neural Network architectures designed for pixel-level tasks are essentially doing a compositional nearest neighbor in a fast manner.
- Such a perspective allows us to explain errors and modify the biases of a network.
- Submitted to *International Conference on Learning Representations* (ICLR2018).

## Honors and Awards

---

### • Honors:

Benz Scholarship (2%)	2017
Peking University Award for Outstanding Student	2017, 2016
DTZ/Cushman & Wakefield Scholarship	2016
Tung OOCCL Scholarship (2%)	2015
Peking University Award for Excellence in Scientific Research (2%)	2015

### • Competitions:

Third Prize in Peking University ACM Competition	2017, 2016, 2015
Meritorious Prize, the Mathematical Contest in Modeling (MCM)	2016
Bronze Prize in 30 <sup>th</sup> National Olympiad in Informatics in China	2013

## Core Courses and Teaching Experience

---

- **Core Courses:** Lab on Operating Systems (97), Practice of Data Structure and Algorithm (94), Introduction to Computing - Honor Track (92), Functional Programming (91)
- **Teaching Experience:** Teaching Assistant of Practice of Programming in C&C++, Spring, 2017

## Skills

---

Deep Learning	TensorFlow, Keras, Theano, Caffe
Programming	C/C++, Python, HTML, JavaScript, Racket (Lisp), Latex
TOEFL	102 (Reading: 29/30 Listening: 27/30 Speaking 23/30 Writing 23/30)
Others	Finished 60,000 lines codes in high school Playing violin for 9 years